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## **PRONUNCIATION INSTRUCTION AND SYLLABIC-PATTERN DISCRIMINATION\***

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Syllable simplification strategies such as deletion (e.g., ‘bag’ [bæ], ‘star’ [tɑː]) and vowel insertion (e.g., ‘bag’ [ˈbæɡi], ‘star’ [isˈtɑː]) are frequent in L2 phonology. In the Brazilian Portuguese-English interphonology, vowel insertion tends to be more recurrent than deletion. The addition of a vowel modifies the rhythm of the English language, since it creates an extra syllable, which might also result in word-stress alternation. All these changes might hinder intelligibility, and for this reason the syllable is an important curriculum component for pronunciation instruction directed at Brazilian learners of English. The present research is an investigation of the role played by pronunciation instruction in the discrimination of English CVC and CV.CV words. The participants of this study were two groups of Brazilian learners (beginners): the control group (10 students), and the experimental group (12 students). Both groups were given a discrimination pretest and posttest, between which the experimental group received instruction based on a pronunciation manual with activities focused on the English syllable and word-final consonants, whereas the control group received no such instruction. The pre and posttests consisted of an oddity discrimination test, in which the participants had to discriminate between the CVC and CV.CV words. The posttest results showed somewhat greater improvement for the experimental group than for the control group, thus suggesting a positive effect for pronunciation instruction.

### **INTRODUCTION**

A number of researchers and educators have made a strong case for the importance of pronunciation teaching as a means of helping learners to communicate successfully (e.g., Pennington 1994; Morley, 1991 and 1994; Celce-Murcia, Goodwin and Brinton, 1996). Nevertheless, the pronunciation component has been greatly neglected in the language classroom and materials. Moreover, when this component is present in course books, it tends to be piecemeal, isolated from other language skills, and focused mostly on descriptive and controlled tasks.

As observed by Pennington (1994), the importance of pronunciation instruction lies in the fact that it can help learners to develop their interlanguage phonology by giving them “the perceptual and the productive experience they need to reconceptualize the performance targets while offering motivation to change and social experiences to develop a new value set” (p. 105).

Research has indicated that the two most important strategies of syllable simplification found in L2 renditions of impermissible syllabic patterns are consonant *deletion* and *vowel insertion* (e.g., Carlisle, 1994; Rebello, 1997, Silva Filho, 1998). When the deletion strategy is used, speakers eliminate one or more segments comprising a syllable. For instance, Vietnamese speakers of English tend to delete word-final consonants in words such as ‘mine’ [maɪ] (Nguyen, 1999).

When speakers resort to vowel insertion as a syllable simplification strategy, a vowel is added before or after a consonant segment (e.g., ‘street’ [ɪstrit], ‘leg’ [lɛ.gi]).

Examples of how language learners resort to vowel insertion to simplify initial clusters that violate the L1 syllabic inventory can be found in the interlanguage of Brazilian and Japanese learners of English as an L2. For example, Brazilian learners may pronounce “sky” with an epenthetic vowel preceding /s/ in the /sk/ cluster: [ɪsʻkaj] (Rebello, 1997). On the other hand, Japanese learners may pronounce the same word inserting a vowel between /s/ and /k/: [suʻkaj] (Abrahamsson, 1997). As regards word-final consonants, Brazilian learners tend to add a vowel to words ending with (a) stops, (b) some fricatives (/f, v, ʃ, ʒ/), and (c) affricates (/tʃ, dʒ/) (Silva Filho, 1998). This is illustrated by their pronunciation of words such as “tape” [tɛjpi], “wife” [wajfi], and “hush” [hʌʃi].

In languages such as English, the deletion strategy is preferred, and this is attested by studies on the syllable simplification strategies employed by adult native speakers<sup>1</sup> when dealing with more complex consonant clusters (Temperley, 1983 and 1987; Young-Scholten & Archibald, 2000). However, in BP, vowel insertion is the strategy most commonly resorted to by adult native speakers when dealing with complex syllabic patterns in the L1 (Câmara, 1970). The preference for vowel insertion is also attested by studies investigating the acquisition of English syllabic structures by Brazilian learners (Rebello, 1997; Silva Filho, 1998). Thus, the word ‘asked’ is likely to be pronounced as [æst] by native speakers of English, but as [ʻæskidʒi]<sup>2</sup> by Brazilian learners of English.

The discussion in the preceding paragraphs indicates that syllable structure is one of the areas that should be addressed by pronunciation teaching when we consider the needs of Brazilian learners of English. Although the syllable structure is widely discussed in recent theoretical phonology literature and has been a frequent item of investigation in interphonology research, it generally does not appear in pronunciation manuals or in publications on the teaching of pronunciation.

In English, all consonants except /h/ can appear in syllable-final position. Conversely, in BP only four consonants are permitted in syllable-final position: the /r/ (realized, depending on regional variety, as a trill, velar fricative, flap, or even retroflex), the lateral /l/, the nasal archiphoneme /N/, and the sibilant archiphoneme /S/ (Collischonn, 1996). However, even these are rather marginal in the coda: the /r/ tends to be deleted (*comer* “eat” [koʻme]); the /l/ is generally realized as the glide [w], or more rarely, as a dark [ɫ]<sup>3</sup> (*mal* “bad” [maw] or [maɫ]); the /N/ loses its consonantal feature with the preceding vowel diphthongizing and assimilating the nasal feature (*bom* “good” [böw]); leaving only the /S/ as a final consonant phonetically. Due to these constraints on syllable structure, BP speakers tend to resort to vowel epenthesis to break up

<sup>1</sup> Studies on different world languages have indicated that, in child language acquisition, the deletion strategy is also preferred over vowel insertion (Young-Scholten & Archibald, 2000).

<sup>2</sup> Note that Brazilians tend to pronounce the –ed morpheme as [id]. Moreover, a natural phonological process in many BP dialects is the palatalization of /d/ when it is followed by /i/.

<sup>3</sup> See Collischonn (1996) and Monaretto, Quednau and Hora (1996)

cross-syllabic consonant clusters in the L1. Thus, words which have not been officially modified to adapt to contemporary BP phonotactic constraints, such as *pacto* (“pact”) and *advogado* (“lawyer”) are pronounced with the epenthetic vowel /i/ or /e/, giving [ˈpakitʊ] and [adivoˈgadu] respectively.

This very productive L1 process is also known to be a frequent syllable simplification strategy in BP/English interphonology for structures such as (a) initial /s/ clusters (‘stop’ [isˈtapi]), (b) medial clusters (‘substitute’: [suˈbistituti], frequently with change in word-stress), (c) final clusters (‘faced’: [ˈfeisid/feisidi], and (d) word-final singleton consonants that are not permitted in BP (‘map’ [ˈmæpi]). The present study investigates the effects of instruction on the perception of English word-final consonants by Brazilian learners, that is, the discrimination of CVC versus CV.CV words. Koerich (2002) has shown that learners who have difficulty producing this distinction tend to be the ones who have difficulty perceiving it; that is, they may hear a word such as ‘fog’ (CVC) as ‘foggy’ (CVCV) and vice-versa.

Some studies have shown that learners tend to build their L2 phonetic system upon the L1 system (e.g., Baptista, 2000; Flege, 1987). According to Flege (1995), language learners perceive the L2 sounds through the “filter” of the L1, which makes it difficult for them to notice certain features that are somehow different from features in similar sounds in their L1. For example, BP speakers tend to hear the English /i/ and /ɪ/ as the BP /i/, given that BP has no tense/lax contrast. Likewise, words ending in a final consonant may be heard as words ending in a vowel (e.g. ‘cloud’ heard as [ˈklau.di]). A way of coping with this problem might be to make learners aware of the differences between the syllable structures of the two languages, as well as to show how the inappropriate transfer of L1 phonological processes (vowel insertion) can hinder communication in the L2. This new awareness should lead to better discrimination of the CVC versus CV.CV words, giving learners the opportunity to internalize the new syllable structure and, thus, ultimately produce final consonants more accurately. A combination of explicit instruction and practice of the CVC syllable structure and communicative activities using the structure might, then, be an effective way to teach the pronunciation of syllable-final consonants.

The original research tested both perception and production of the English CVC structure, but this paper reports only the perception results. Thus, assuming that better discrimination will ultimately lead to better production, the purpose of this study was to find out whether pronunciation instruction can lead to better discrimination between words ending in CVC or CV.CV.

Interphonology research on the syllable has focused on consonant clusters (e.g., Abrahamsson, 1997; Broselow, 1987; Carlisle, 1991; Cornelian Júnior, 2003; Eckman, 1991; Major, 1994; Rebello, 1997) and word-final consonants (e.g., Baptista & Silva Filho, 1997; Koerich, 2002; Silva Filho, 1998; Silveira, 2002; Yavas, 1997). A number of these studies have dealt with Brazilian learners of English and the syllable simplification strategies they resort to in order to pronounce syllabic patterns not permitted in BP, but we still need studies testing if pronunciation teaching could improve these learners’ perception and production of CVC words.

The present research investigates the effect of instruction on the perception of the CVC and CV.CV words. The following research questions guided the present study:

- How do BP learners perceive the contrast between CVC words (e.g., ‘fog’) and CV.CV words (e.g., ‘foggy’)?
- How does pronunciation instruction targeting the discrimination between CVC and CV.CV words influence BP learners’ perception of these contrasts?

## METHOD

### Participants and Instructional Content

Participants were two groups of first-semester English students from an English extension program in Brazil, a mixture of real and false beginners, many having had some English in high school. Most were graduate or undergraduate university students pursuing various majors, a few were junior high students, and some just people from the community. It was not possible to randomly select students or to match the groups for proficiency level, but the two groups were expected to be quite similar. The experimental group began with 16 students but was reduced to 12 (6 males and 6 females) with ages ranging from 18 to 28 ( $M = 21.83$ ,  $SD = 3.01$ ), and the control group began with 15 students and was reduced to 10 (7 males and 3 females) with ages ranging from 14 to 22 ( $M = 18.88$ ,  $SD = 2.66$ ). Reductions were due to the elimination of students who did not complete all the tasks of the study.

A pronunciation manual developed specifically for this study was used with the experimental group, together with the regular textbook during the instructional period. The content of the manual was limited to activities for teaching learners the differences between English and Brazilian Portuguese syllabic patterns and the inappropriateness of the use of an epenthetic vowel to overcome the articulatory problems posed by these differences. The activities developed for practice included vocabulary items with the same word-final consonants as in the discrimination test – /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /dʒ/, /m/, /n/, and /ŋ/ – but the three nasals were not practiced for lack of time.

The manual was organized according to the communicative framework suggested by Celce-Murcia et al. (1996), i.e., consisting of the following five steps: (a) description and analysis; (b) training in perception; (c) controlled practice and feedback; (d) guided practice with feedback; and (e) communicative practice and feedback.

### Discrimination pretest and posttest

To test whether or not the participants could perceive the difference between monosyllabic words ending in a consonant (e.g., ‘fog’) and disyllabic words ending in the same consonant followed by /i/ (e.g., ‘foggy’), an *oddity discrimination test* was developed, based on Flege, Munro & Fox (1994) with some adaptations. The consonants included in the discrimination test were /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /dʒ/, /m/, /n/, and /ŋ/. All word pairs were minimal pairs consisting of a CVC/CV.CV structure, with no consonant clusters and where the disyllabic word ended in /i/. A native speaker of American English recorded the sentences used in the discrimination test. The test contained sets of three sentences (Flege et al.’s (1994) version included sets of isolated syllables), where one contained a target word that differed from the other two of the same set. The carrier sentence was always “Say ... now,” as in the set below, where sentence “b” contains the odd item:

- a. Say *move* now.
- b. Say *movie* now.
- c. Say *move* now.

Each target consonant appeared in two of the change trials – one where the odd item out was the monosyllabic word and one where it was the disyllabic word – giving 24 target *change trials*.

As can be seen in Table 1, the test also included (a) six distracter change trials containing words dealing with other difficult vowel and consonant contrasts; (b) eight *catch trials* (as in Flege et al., 1994), where the three sentences of the set were identical: two of the catch trials contained distracters, and six of them contained the target consonant sounds /p/, /t/ and /k/. Thus, the discrimination test had a total of 38 sets of sentences; ten of the sets contained a different word in item “a”, ten in item “b”, ten in item “c”, and eight of them (the catch trials) had no different words at all. The catch trials were expected to give some guarantee that the participants were paying attention to the three sentences of each trial, but the main analysis was based only on the change trials.

Table 1  
*Perception test design.*

	a	b	c	The same	Total of sets	Total of sentences
Target consonants	8	8	8		24	72
Distracters	2	2	2		6	18
Catch trials				8	8	24
<b>Total</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>8</b>	<b>38</b>	<b>114</b>

## Procedures

The data collection procedures were carried out separately for the experimental and control groups, and the discrimination and production tests were given in a single session for each. The pretest was administered to both groups in the seventh week of the course, just before the experimental group started their pronunciation instruction, and the posttest was given one week after the conclusion of the experimental group's period of pronunciation instruction.

Before beginning the discrimination test, the participants received a brief training session with three sets containing difficult vowel and consonant contrasts (similar to the distracters) to become familiar with the task. It was necessary to give the training session twice to make sure all participants understood. For both the training session and the test itself, participants were given a sheet of paper on which, for each set, they checked “a”, “b”, or “c” for the sentence that was different; or *todas iguais* (“all the same”) if the three sentences were the same. The same procedures and materials were used in the posttest.

The English course was a 45-hour course, taught in one semester in thirty 90-minute classes meeting twice a week for 15 weeks. For the experimental group, the pronunciation lessons took up about 40 minutes of one weekly class for a period of six weeks, resulting in four hours of pronunciation instruction. These lessons were based on the manual described in the previous subsection, and although the activities focused on pronunciation, they were also intended to be an opportunity to practice or revise the content presented in the textbook that was used as the main material in the course. During this time the control group received no pronunciation instruction regarding the features investigated, but just had more time for the normal activities in

their regular textbook. The researcher was in charge of teaching both the experimental and the control groups.

## RESULTS AND DISCUSSION

As stated in the Method section, the experimental and control groups were expected to be of approximately equal proficiency. However, although the two groups obtained similar scores in the first general language skills written exam, this expectation was not borne out regarding the discrimination of CVC and CV.CV words. Table 2 shows that the control group demonstrated better discrimination of the CVC versus CV.CV words than the experimental group in the pretest change trials: 75% ( $M = 18$ ;  $SD = 3.98$ ) compared to 61% ( $M = 14.67$ ;  $SD = 4.25$ ) respectively.

As the number of participants in each group was rather small and the data presented no normal distribution, an independent sample Mann-Whitney test was run to compare the means of the pretest between groups. The results showed this difference to be significant ( $z = -1.88$ ;  $p = .05$ ), and a medium effect size was found ( $D = 0.80$ ,  $r = .37$ ). Thus, the control group was significantly better in discriminating the two syllable structures in the pretest than the experimental group.

Table 2

*Frequency of correct responses in change trials of the discrimination test.*

	Control Group N = 240 (10 x 24)		Experimental Group N = 288 (12 x 24)	
	Pretest	Posttest	Pretest	Posttest
No. correct	180	200	176	222
% correct	75	83	61	77
Mean per partic.	18.00	20.00	14.67	18.50
SD	3.89	3.65	4.25	5.30

Because the control group performed so much better on the pretest, the starting point of the two groups was quite different. The control group continued to perform better on the posttest: 83% ( $M = 20$ ;  $SD = 3.65$ ) compared to 77% ( $M = 18.50$ ;  $SD = 5.30$ ) respectively. However, in the posttest the difference was only 6 percentage points.

Once more a nonparametric test was used to compare the results between groups. The Mann-Whitney test showed the difference between the two groups in the posttest to be no longer significant ( $z = -.47$ ,  $p = .63$ ), and a small effect size was found ( $D = 0.32$ ,  $r = .16$ ).

The fact that the difference between the two groups was significant before treatment and was no longer significant after the treatment suggests that the treatment may have made a difference in the discrimination performance of the experimental group. Another way of verifying this tendency is by examining the gain scores from the pretest to the posttest.

The results displayed in Table 3 show that, in general, the experimental group obtained higher gain scores ( $M = 3.83$ ,  $SD = 4.09$ ) than the control group ( $M = 2$ ;  $SD = 4.55$ ). However, an independent sample Mann-Whitney test showed that, although the mean gain score for the experimental group was almost twice that of the control group, this difference between the gain scores of the two groups was not significant ( $z = -.64$ ;  $p = .52$ ), and a small effect size ( $D = .42$ ,  $r = .20$ ) was found. Thus, while it appears that pronunciation instruction might have had a slight effect on the experimental group's ability to discriminate between the CVC and CV.CV words, this hypothesis cannot be confirmed.

Table 3  
*Gain scores in the discrimination test from pretest to posttest.*

Participant	Control Group		Experimental Group	
	Participant	Score	Participant	Score
S1		10	S11	9
S2		2	S12	3
S3		-8	S13	12
S4		1	S14	1
S5		3	S15	8
S6		1	S16	1
S7		7	S17	2
S8		0	S18	5
S9		3	S19	1
S10		1	S20	5
			S21	-2
			S22	1
Total		20		46
Mean per partic.		2.0		3.83
SD		4.55		4.09
Maximum		10		12
Minimum		-8		-2

The lack of significance in these results was probably influenced by the high standard deviations – greater than the means for both groups, which highlights the power of individual differences, a crucial factor in SLA classrooms and research. It can be seen in Table 3 that only one participant in each group (S1 and S13) achieved an increase of 10 points or more in their rates of correct responses in the discrimination posttest, and one participant in each group (S3 and S21) actually obtained worse results in the posttest. It is tempting to speculate that the somewhat higher gain scores of the experimental group may be related to the pronunciation instruction they received and that larger groups might have yielded significant results. Nevertheless, most participants in the control group also showed some improvement in their performance on the posttest, suggesting that other factors besides instruction might have influenced the posttest results, such as task familiarity and exposure to L2.

As explained in 3.2, the role of the catch trials was to verify whether the participants' responses were not mere guesses, as guessing would frequently have led to choosing an odd item out when there was none. The participants managed to correctly identify more than 80% of all catch trials in the pre and posttests. These results seem to indicate that the participants were not merely making wild guesses in the discrimination test, and thus, that the results can be assumed to faithfully represent how often the participants were actually discriminating between the pairs in the change trials.

On the other hand, there may have been an effect of the position of the odd item in each trial. There were a total of 24 change trials, where the odd item could appear in first, second, or third position. The odd targets that appeared in third (“c”) position tended to trigger the lowest error rates for both experimental and control groups in the pretest, whereas for the posttest, the three

positions yielded similar rates. This result suggests a possible drawback in the design of the discrimination test, which relied heavily on the participants' ability to hold three sentences in their memories for each set and to compare them in order to identify a subtle phonological distinction. This drawback may have been less important in the posttest because of a practice effect.

### **FINAL CONSIDERATIONS**

The results show (a) that the experimental group had significantly more difficulty with the CVC/CV.CV distinction before instruction than the control group; (b) that the experimental group continued to perform somewhat worse after treatment, but the difference between the two groups was no longer significant, thus indicating a positive effect of pronunciation instruction; and (c) that there was a tendency for greater improvement on the posttest for the experimental group, but the differences were not significant. Improvement in the posttest was found for both the experimental and the control groups, which suggests that pronunciation instruction is not the only factor influencing the acquisition of English codas, but that L2 proficiency may also play an important role. Therefore, it is possible that language exposure per se helped learners to begin to discriminate between the CVC and CV.CV words.

There were several limitations to the study, which might have interfered in the results. In addition to the small number of participants in each group, the test design itself may have caused the participants some difficulty due to the use of sentences, rather than isolated items. Memory limitations may have made those trials with the odd item in the first or second position more difficult than those where it appeared in last position. While the equal distribution of all targets among the three positions should not have biased the results in terms of which targets were more difficult, this may have made the test more difficult for those participants with lesser short-term memory capacities and thus masked improvement. This problem suggests that the use of an oddity discrimination test might not be the best way of collecting data from beginners; maybe an identification test could be used in future studies.

Although it is not possible to affirm that including the syllable in the English pronunciation syllabus led to better discrimination of English CVC/CV.CV words by Brazilian learners, there did appear to be a tendency in that direction, sufficient to encourage similar endeavors without the limitations of this exploratory study, which might achieve more conclusive results.

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